HR Analytics for Predictive Decision Making: A Study of Multinational Corporations

SYNOPSIS

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Section-1

1.1 Introduction: In an ever-changing work environment today, Organizations are expanding their reach across geographies and embracing skills with efficient usage of information and communication technology (ICT). With automation of the many time unit functions and wide separate business units, it has become obligatory on the part of organizations to form wealthy knowledge supply. Not solely the creation however additionally effective utilization of time unit knowledge, can facilitate organizations in correct time unit price creation. The use of data and analytic tools to inform decisions about how to manage people is known as HR Analytics as well as People Analytics HR Analytics is the word that came with the mix of two individual words: HR (People) (Employee) and Analytics Literal meaning of HR is the human who is working in any organization (Employee) and the organizations make proper utilization of their knowledge and skills for achieving both the individual and organizational objectives and Analytics stands for Analyzing or deep study or understanding of the data. (Investopedia, 2020). Orit can be defined as the systematic computational analysis of data or statistics is Analytics. (Wikipedia,2020).

As a process, HR Analytics is the systematic identification and qualification of the people drivers of business outcomes (Heuvel & Bondar Ouk, 2016). HR Analytics is the application of statistics, modeling, and analysis of employee related factors to achieve organizational objectives and to improve overall business-related outcomes. It is also known as People Analytics, Talent Analytic or Workforce Analytics (https://www.analyticsinsight.net). People Analytics allows HR professionals to make data driven decision to attract, manage, retain and develop the employees, which ultimately results as improved "ROI". Analytics of hands (one of the foremost vital asset) of organization can facilitate HR practices to urge aligned with the business strategy of the organization, thereby creating HR as a strategic Business partner. HR professionals gather data across the organization from various sources like: employee surveys, attendance records, tele metric data, multi-rater reviews, salary and promotion history, employee work history, demographic data, personality and temperament data, recruitment process, employee data base etc. and the data sources are combined, cleaned and used for reporting and people analytics purpose. In the present situation, heaps of data available that measure the execution of HR processes like headcount, vacancies, time to fill, completion of performance

reviews, distribution of ratings of performance, details on individual development plans etc. Though, the use of HR analytics is still limited to describe these processes without embedding the initiatives in strategic context. People Analytics helps HRM:

• Make better decision-making using data.

• Create a business case for HR interventions/involvement.

• Test the effectiveness of this intervention/involvement.

• Move from operational to tactical or strategic.

Hence, HR decisions are no longer based on gut feelings, whereas through this data driven approach HR Analytics can illuminate the major causes of employee dissatisfaction and attrition and help in finding the best suited strategies for overall development.

HR Analytics plays a vital role in current business changing environment as its focuses on data driven decision-making practices to enable organizational effectiveness and growth. It validates better decision making about workforce working in the organizations by using employee data. People Analytics in Practice rigorously tracks the performance of all employee, comparing it to evaluations when they were hired, helps refine the most productive steps in the hiring process, where to allocate more resources, etc. HR Analytics provides a support to the organization for mapping HR metrics with strategic business objectives and goals. It mainly focuses on decision making by applying strategic approach in HR policies and practices for acquiring talent to assessing future HR need by improving employee morale and satisfaction. HR analytics determines data analysis and interpretation to find out new trends and take corrective measures for profitable functioning of business. Organizations support innovations to improve efficiency and HR analytics has the highest impact on organizational success.

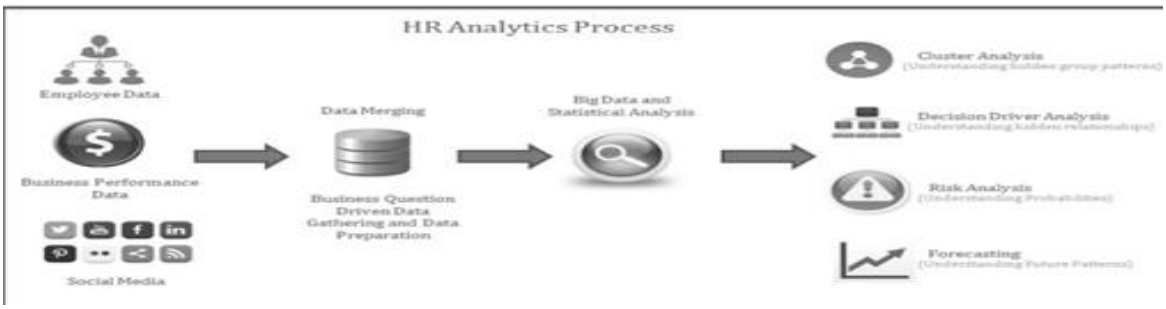

Figure1. HR Analytics Process
(Source:https://jenifferanakfrancis.wordpress.com/2020/04/22/5-1-chapter-1-overview-of-hrd-analytics/)

Evolution of HR (People) Analytics: The core of People (HR) Analytics is the "Metric". Matrices can be said as a data that conveys meaning in the given context. For example: there are some statements like: "Employee turnover is 13.5% per annum" this statement is considered as Data. Other statement is" There is 4% rise in attrition rate on a year to this year basis" this statement is considered as Matrices. (Massey Cade et.al. People Analytics, 2018) But Analytics is not so much about the numbers as it is to do with the reasoning and logics. Analytics is different from Analysis. Analysis is equivalent of number crunching whereas analytics is the methodology of logical analysis. (AIHR,2016). Analytics uses Analysis but then builds on it to understand the "Why" behind the figures and/or to predict decision HR Analytics is based on Data. It uses data to predict the future. Considering historical background, evolution of People Analytics relates with the Hawthorne Study (1920) by Elton Mayo because it was the example of behavioral research. In 1960's Greek Hofstede set up personnel research department in IBM. He arrived at the cultural dimension theory based on extensive research. In 1980's Dr. Jac Fitzenz setup "Saratoga" institute to develop and benchmark Metrics in HR. He pioneered a list of 30 metrics that can be used across the companies. He created HCM 21, a predictive strategy human capital system. (Jean Paul Isson Jesse S. Harriott, 2016). In the same era, Dr. John Sullivon worked on HR Measurement and Talent Acquisition. In 1995 Mark Huselid emphasized on the strategic impact of high-performance work system'. He reported one sigma impact on business performance due to HR policies and practices. Moreover, in the meanwhile Gallup Q12, presented set of 12 questions that predicts employee engagement. In 1998 Sears produced a model known as 'Employee-Cost-Profit-Chain'. In 1990's Balanced Scorecard Concept was created. And in the current era Google researched 8 key behaviors of managers and 3 pitfalls by using statistical and analytical techniques.

Why HR Analytics: HR Analytics can be defined as "a methodology for understanding and evaluating the causal relationship between HR practices and organizational performance outcomes (such as customer satisfaction, sales or profit), and for providing legitimate and reliable foundations for human capital decisions for the purpose of influencing the business strategy and performance, by applying statistical techniques and experimental approaches based on metrics of efficiency, effectiveness and impact" (Lawler, Levenson & Boudreau, 2004; Boudreau & Ramstad, 2006)

HR/People Analytics is that the systematic identification and quantification of the individuals drivers of the business outcomes. In today's situation organizations have prime quality unit of time, knowledge. However, they possess struggle to use it effectively to predict personnel trends, minimize risk and maximize retention, unit of time Analytics helps in it. Data driven insights to create choices are invariably higher than the judgmental or subjective unit of time practices in terms of accomplishment and choice, coaching and development, employee engagement etc. Hence, regular trailing and prediction of crucial HR metrics is usually indispensable. Synergy Measured by HR Analytics: Recruitment**,** Induction**,** Training**,** Employee Development**,** Employee Productivity Management**,** Compensation management**,** Payroll Management**,** Employee Satisfaction**,** Employee Engagement**,** Employee Learning**,** Employee Retention**.** Hence, the solution of the question: Why is individuals Analytics rising now? Might be.....

Technical progress - knowledge accessibility, process power, analytical tools, etc.

• Growing recognition of behavioral biases.

• Increasingly, a firm's greatest assets are its individuals.

Section-2 Literature Review:

In our society, it's usually assumed that success is just a matter of basic ability. People who have high ability can usually show high accomplishment whereas people who have lower ability can usually let down. Past literature, however, shows that a lot of bright students show hanging performance, which many that could have appeared less bright students end up achieving an excellent deal quite one would have expected. Specifically, researchers theorized that accomplishment things may mean various things to completely different students (Dweck & Elliott, 1983; Dweck & Leggett, 1988; Elliott & Dweck, 1988). Some researchers may see these things as tests of their ability, whereas others may see them as opportunities to learn one thing new. Thus, this chapter focuses on self- conceptions and motivational processes in researchers. The review of literature will offer larger understanding of psychological feature processes in students and insight into the origins of accommodative and adaptive functioning. Gupta B.N (2018), People Analytics: Novel Approach to Modern Human Resource Management practices, in his paper concluded that the People Analytics is a data driven approach to improving people related decisions for the purpose of advancing both individual and organizational

success. HR Analytics: An emerging scale for evaluation of human assets 2017), Khan Hameem's paper suggested that HR Analytics becomes must have option for organization and analytics is all about decision making by using employee data, right from recruitment or retirement and so many strategies will be performed by HR professionals towards employees. Dag Oivind Madsen (2016), on The Rise of HR Analytics: A preliminary exploration shown that a number of supply side actors have played influential roles in the HRA fields. Furthermore, the important role social media in the popularization of HRA is also notable and it appears that the dissemination and diffusion of technologically infused management concepts such as HRA and Big Data is increasingly happening online. Marten et.al (2013), A for Business Analytics in Performance Management, suggests that with the adequate use of knowledge and analytical ways business dynamics may be controlled. Dulebohn & Johnson (2013), paper Human Resource Metrics and Decision Support: A Classification Framework: highlights, the issue that although HR managers have developed a greater number of metrics, a lack of guidance is still lurking around with respect to where to apply those metrics, and to incorporate them into Distributed Support Systems (DSS) and Business Intelligence tools, eventually adding value to the HR. Hence, a framework is provided along with some guidance to researchers and managers. In addition to the framework, the type of metrics to be considered and DSS fit HR activities in alignment to the level of organizational. Hota & Ghosh (2013), Workforce Analytics Approach: An Emerging trend of Workforce Management, explains the workforce analytics as the new corporate mindset. It reveals that adopting nonaligned analytics strategy is increasing, which results the future of the firms in doldrums. Having an end-to-end range of analytics capabilities supported by an integrated analytics strategy, organizations are advised to enlarge, or cut short, the distance between themselves and competitors to their own competitive advantage. Kapoor & Sherif (2012), Human Resources in an Enriched Environment of Business Intelligence work, signifies the most vital problems of educating multinational companies to align their HR processes and practices to the altering global labor market conditions. By adding BI and Data analytics in the DNA of HRM protocols and database strategies they can very well attract develop and retain their top talent and be a fore runner in the global business competition. Ingham Jon (2011), using a Human Capital Scorecard as a Framework for Analytical Discovery, suggests that the best way to tie up the entities of analytics and strategy is through a human

capital scorecard. The scorecard is derived from a strategy map like the original balanced scorecard, which connects inputs, human resource activities and human capital outputs together and also depicts how these are linked to HR's impacts to the bottom line growth. Kremer Kristia (2018), HR Analytics and Its Moderating Factors, according to this theoretical research HR professionals need to be able to identify organizational problems and to ask the right questions. Analyzing a large amount of data trying to answer the wrong question will most likely damage the interests of employees instead of being beneficial. HR Analytics requires an infrastructure that makes accurate and consistent data across functions and even external to the organization accessible and information technology is needed that goes in the direction of advanced analytics and focuses on data exploration, analysis and modeling. Bondarouk et.al (2017), The Rise (and Fall) of HR Analytics, suggests that HR analytics will have a major influence on decision making in organizations in the coming years. Also, HR Analytics is likely to influence the composition and role of HRM as a function. It can help to ensure lean and agile organizational structures that are based on an optimal combination of people characteristics and skills on the one hand and strategic business targets on the other hand. Malisetty Sainath et.al., (2017), Predictive Analytics in HR Management, from this study, the key areas are identified from which the predictive analytics can create the values for HR perspective including 1) Employee Profiling, 2) Employee Attrition and Loyalty Analysis, 3) Forecasting of HR capacity. Johannin Rutger (2015), the future of HR Analytics-A Delphi method study, concluded that In terms of valuing HR Analytics, in 2025 organizations do consider HR Analytics as a necessary part of Human Resources, and as a crucial linkage in the decision making process. Mishra Sujeet etal, (2016), Human Resource Predictive Analytics for HR Management in Organizations, according to this research industries cannot survive in the long run if they do not possess predictive analytics skills from the human resource management. The usefulness of predictive analytics is wider and hence application in all related areas of HRM is essential. Momin Weenact.al. (2015), HR analytics transforming human resource management: This paper suggested that the problems which the companies were facing has been identified and resolved with the help of HR Analytical software. The problems of HR viz. succession planning, recruitment, manpower planning, forecasting of turnover etc. all can now be solved with the new technology like HR analytics, HR analytics has helped the organizations to

improve their performance by creating a network of individuals to function as a strategic partner. Kakade Kiran et.al. (2018). HR Analytics: Transactional To Transformational HR Approach, states that, In today's business context having the access of business analytics most of the organization have been making 'efficiency drive', taking 'austerity measures slashing budgets, and taking other action in order to cut costs Organization doing massive cost cutting exercise, which they claim are needed to service during difficult economic times. Lakshmi Madhavi et.al. (2016), Hr Analytics-A Strategic Approach to HR Effectiveness concludes that, to play a more relevant and strategic role in the organization, the HR function needs to move beyond mere reporting to accurate prediction. Instead of just generating reactive reports, it needs to embrace advanced analytics and predictive techniques that support strategic organizational goals. Mohammed Abdulquddus (2019), HR Analytics-A Modern Tool in HR for Predictive Decision Making, contributes greatly to the field of human resource management in which the information explores the range of possibilities that HR analytics opens up for tasks in HR and administration. TV Anjali (2018), HR Analytics and its Impact on Organizational Excellence, paper concludes that big data analytics became the new force in contemporary HR management. Companies that use this HR model spend less time and resources on hiring decisions and increase employee engagement, productivity, and retention rate and ensure long term success. Marler et.al. (2016), An evidence-based review of HR Analytics, HR Analytics is long-lived innovation that eventually diffuses across companies to become an institutionalized HRM practice or a short-lived fad. Rogers (2003), Diffusion of innovation theory (Case Study), this case study notes that the innovation-decision process is an information seeking and information processing activity in which an individual obtains information to gradually decrease uncertainty about the innovation. Credit Suisse (2015), The Algorithm That Tells the Boss Who Might Quit (Case Study), this case study explored how Credit Suisse (company) was able to predict who might quit the company by using the concept of analytics and the business impact of using this concept was found that company possess approximately $ 70,000,000 in savings per year by retaining high performing employees. Experian (2016), Safeguarding talent and saving $14m with workforce analytics (Case Study), Employee attrition at Experian was a problem. The company was facing levels of turnover that were 3-4% higher than they wanted it to be. By building a predictive model that included 200 attributes, including team size and

structure, supervisor performance, and length of commute, they were able to predict flight risk and the estimated savings of $8,000,000 to $10,000,000 over the past 18 months. Unilever (2017): automated listening during a hostile takeover (Case Study), When Kraft Heinz launched a hostile takeover bid in early 2017, Unilever's workforce analytics team showed that analytics could also be deployed in times of crisis. The team analyzed networks in the organization and create models to come up with potential cost reductions. Malini N. (2018), Human Resource Analytics and its adoption, results that adoption of the technology would be coming into pace till 2025. Lawler Edward E. (2003), HR Metrics and Analytics Uses and Impacts, suggest that not all data are equally powerful when it comes to making HR strategic partner. Having analytic data about strategy is a powerful way to gain a seat at the strategy table, while data about the operation of the HR function is not.

Table:1 Review of Literature in Matrix Form

S.No	Author	Year	HR Analytics Variables						
			HR Activiti	Workfo rce	Use of Techno logy	Data driven	Data	HR	Big Data
1	Gupta B.N.	2018	✓				✓	✓	
2	Khan Hameem	2017			✓		✓		
3	Dag Oivind	2016	✓				✓	✓	
4	Marten et.al	2013			✓	✓	✓		✓
5	Dulebohn&Johnson	2013					✓	✓	
6	Hota& Ghose	2013			✓		✓	✓	
7	Kapoor &Sherif	2012	✓	✓	✓	✓	✓	✓	
8	Ingham Jon	2011		✓				✓	
9	Van Joerd et.al.	2017	✓		✓		✓	✓	✓
10	Kristia N. kremer	2018	✓			✓	✓	✓	
11	Malisetty Sainath et.al.	2017	✓	✓	✓	✓		✓	✓
12	RutgerJohannin	2015	✓	✓	✓		✓		✓
13	Mishra Sujeet et.al.	2016		✓	✓	✓			
14	Weena Yancey et.al	2015		✓			✓	✓	
15	Kakade Kiren et.al.	2018	✓			✓		✓	
16	Lakshmi Madhvi et.al.	2016	✓				✓	✓	
17	Mohammed Abdulquddus	2019	✓						
18	Lawler Edward	2018			✓	✓	✓	✓	
19	TV Anjali	2018	✓		✓				
20	Marler et.al.	2016		✓			✓	✓	
21	Rogers	2003	✓	✓	✓	✓	✓	✓	✓
22	Credit Suisse	2015					✓		
23	Experian	2016	✓		✓			✓	✓
24	Unilever	2017			✓				
25	N. Malini	2018	✓	✓	✓		✓	✓	

Gap Identification in existing research related to HR Analytics:

In current scientific literature the decision for Evidence-Based Data Driven Decision Making is rising. Authors like Pfeffer and Sutton (2006) and Briner, Denyer and Rousseau (2009) dedicate their research to the force of Evidence- Based Data Driven Decision Making on human resource management practices, and afterward the business performance. When we hold this view considering this functioning of Human Resource (HR) departments and their management of the human capital in many organizations, it is argued that HR is doing a poor job with relation to Evidence-Based Data Driven Decision Making. Though HR interventions like training and payment can lead to outcomes like an increased satisfaction and commitment, that subsequently influence the organizational performance, decisions are mostly not supported by a complicated data analysis. In spite of all the progress that has been made in academic research (Paauwe, 2009) and therefore the increasing acknowledgment of the substance and worth of HR (Boudreau & Ramstad, 2006), only a few organizations are nowadays able to measure the important value that employee wakes their business (Mayo, 2008). Most of the organizations is thus ineffectual to live the contribution of their intangible assets objectively or supported the correct measures. Instead, methods used are standard analytical tools, like regression, and most organizations only concentrate on data that is easy to understand and/or consume (Fink, 2010). In general, the most focus of HR is on collecting and reporting data about activities rather than outcomes, while the analyses are mostly very simplistic (e.g., limited analyses of drivers of outcomes). As a result, there's desire for HR to itself from descriptive metrics to predictive analytics (Ulrich, 2010). To attain an Evidence-Based Data Driven Decision-Making approach for HR within organizations, this study is aimed toward highlighting the methods and instruments utilized in the sector of HR analytics.

Gaps Identified in Literature are as: Relatable Past HR practices keep a track of skills honed and yet to garner for holistic human resource management approach. Biasness of HR managers in assessing the human resource practices has not been recognized as a criterion in the already established tools of Human Resource Management. By reviewing and synthesizing the literature all the previous analysis during this specific field was done solely on the premise of Review based mostly analysis. No information driven analysis in the context of Multinational Corporations has been

conducted, nonetheless. It has been observed that the broader subject of Business Analytics was wide studied, though very little analysis has been undertaken on the HR Analytics. Though in the literature studied, the decision making, frequent and formal/informal conversations between HR manager and employee is considered critical but the frequency of such conversations are not established or analyzed. In order to attain an Evidence-Based Data Driven Decision-Making approach for HR within organizations, all the prior studies are aimed toward highlighting the methods and instruments utilized in the sector of HR analytics not in the testing of their effectiveness.

Prior available research does not contain effect of pandemic situation in the strategies also.2.1 Problem Statement: “Is HR Analytics an effective tool in HRM practices for predictive and evidence-based data driven decision making in the era of big data with the effect of pandemic situation?"

To be ready to provide a solution for the matter statement this study will make use of two components: a quantitative part for testing hypotheses with the help of a questionnaire, and a qualitative part for exploring propositions by means of interviews and case studies. Because the concept of HR analytics is often considered as a comparatively new approach, theory will not always be available to develop supported hypotheses. For this reason, interviews are conducted furthermore to explore the link between the appliance of HR analytics and its related contingency factors. Within the end these propositions possibly is reformulated into hypotheses which might be tested further by means of follow-up research.

Section-3

3.1.1 Detailed Explanation of 4 C's HR Analytics framework: There is a need to move towards more encompassing HR Analytics process, that absorbs the disruption caused by the advent & usage of ICT, caters to ambitious 21st century workforce and bring teams across on a common platform to support the common objectives. But on study of literature as described above there is paucity of a set, fixed or specific framework or process around HR Analytics which has been emphasized or established to cater to the ever changing challenges of new age technology and work environment. This lays a tremendous opportunity to establish and propose a framework which would encompass all the fundamental and important elements of the HR Analytics process which could make it more enriching and data driven decision making for the organization in today's scenario where

organizational concepts are dealing with Big Data. This ecosystem demands speed, needs to cater the resources 'evolving skills and the penetration of technology into the lives. The framework proposed can be applicable to multinational corporations who are using the concept of analytics in practices of HRM over the world.

Considering HR Analytics is a data driven exercise, where now the advent of technological advancement is getting imbibed, researcher is envisaging a framework that has fundamentally encapsulated all important and critical aspects & elements that can make the framework more holistic and value driven.With the styles of information and technologies that are now available to several, the chance for HR to be strategic is not only possible but highly desired. HR decisions and actions must be supported data, information, and evidence. The 4Cs (Collect, Connect, Correct, Control) framework below is an easy-to-follow roadmap to assist lay out the muse for addressing big data in HR analytics. (Framework created by the researcher)

1C - Collect: Big data refers to the big quantity of knowledge that is collected and aggregated by HR for the aim of analyzing and evaluating key HR practices, including recruitment, talent management, training, and performance. Collecting and tracking high quality data is that the first vital component of HR analytics. The data must be easily obtainable and capable of being integrated into a reporting system. The info can come from HR systems already in situ, learning & development systems, or from new data-collecting methods like cloud-based systems, mobile devices, and even wearable technology. The system that collects the info also must be ready to aggregate it, meaning that it should offer the flexibility to sort and organize the info for future analysis. What type of data is collected: Employee Profiles, Recruitment, Performance, Data on High-Performers, Data on Low-Performers, Salary and Promotion History, Demographic Data, On-Boarding, Training, Engagement, Retention, Turnover, Absenteeism, Human Capital, Quality Checks and Control.

All these types of data can be worked on and analyzed by the tools and techniques of HR Analytics.

2C-Connect: At this stage the analyst started creating a connection with the data retrieved from different sources for different reason; so, the information begins a process of continuous measurement and comparison. This process is also considered as HR metrics. Human Resource (HR) metrics are measurements used to determine the value and effectiveness of HR initiatives (Boudreau; Lawler &

Levenson, 2004) HR metrics (analytics) initially compare collected data against historical norms and organizational standards. The method cannot depend upon one snapshot of information, but instead requires a continual feed of information over time. The data also needs a comparison baseline. For example, how does a company know what's an appropriate absentee range if it's not first defined?

In HR analytics, key metrics that are often monitored by the companies are: 1. Organizational performance: Data is collected and compared to rise understand turnover, absenteeism, and recruitment outcomes. 2. Operations: Data is monitored to work out the effectiveness and efficiency of HR day-to day procedures and initiatives 3. Process optimization: This area combines data from both organizational performance and operations metrics to spot where improvements in process are often made.

3C-Correct: Errors are common and they the norms, not the exceptions, when working with data. By now, it has been probably heard the statistic that 88% of spreadsheets contain errors. Since it cannot safely assume that any of the information which has been worked with is error-free. The researcher's mission should be to seek out and tackle errors within the best way possible.

4C-Control: Control concept is based on the base of Kaizen means Continuous improvement. The study and practice of manipulating dynamical systems is broadly referred to as control theory, and it is one among the foremost successful fields at the interface of statistics and practical engineering. Control theory cannot be separated from data analytics because it relies on sensor measurements (data) obtained from a system to realize a given objective. In fact, control theory deals with living data, as successful application modifies the dynamics of the system, thus changing the characteristics of the measurements. Control theory forces the researcher to confront reality, as simplifying assumptions and model approximations are tested. Once the information is cleaned, it is often analyzed. Analysts may apply a range of techniques spoken as exploratory data analysis to start understanding the messages contained within the data. The process of exploration may end in additional data cleaning or additional requests for data, so these activities are also iterative in nature. Descriptive statistics, like the common or median, is also generated to assist understand the info. Data visualization can also be accustomed examine the information in graphical format, to get additional insight regarding the messages within the information.

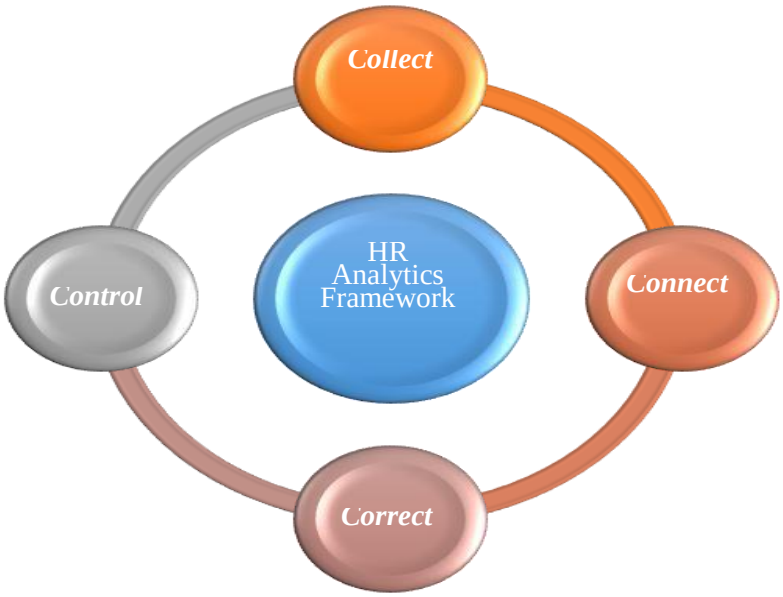

Figure: 2 Conceptual Framework of 4 C's HR Analytics Framework (Source: By Researcher)

The Conceptual Structure of 4 C's framework highlights the operational implementation of the framework that focuses on alignment of the goals and standard of the organization/project with the individual skills and competencies. Appropriate objective/goals and approach affiliated with right skills and competencies of resources would empower the team for speedy and quality execution.

Section-4

4.1.1 Objective of the Study:

After critically reviewing the current literature and exploring the need of the study, the key objectives of present study are: To investigate and gain insight into the long run of HR analytics if integrated into the multinational corporations to help managers in predictive decision-making supported statistical evidence and relevant HR analytical data and literature.

1. To analyze the impact of pandemic strategies adopted by MNC's for predictive decision making through HR Analytics.

2. To explore the effectiveness of 4C's framework as an efficient HR analytics framework.

3. To develop a model to look at the IT infrastructure and technological interventions made in terms of the effective implementation HR Analytics.

4.1.2 Hypothesis and Methodology

4.1.3 Hypothesis: Hypothesis formulation will help to study and explore the relatedness of the elements. The Hypothesis to be tested is as:

Ha-There is significant level of greater the application of an HR analytical approach in the era of big data.

Ha-There is significant impact of applicability of data analytics in the practices of human resource management pre pandemic.

Ha-There is significant impact of applicability of data analytics in the practices of human resource management with the effect of pandemic situation.

Ha- There is significant level of applicability of HR analytical approach in business dynamics.

Ha-HR analytics is a relevant for data driven decision making in the organization.

4.1.4 Research Methodology: This research work shall be a descriptive as well as analytical in nature based on survey observation/interview/case study techniques.

4.1.5 Scope of the Study: Multinational Companies who are using the concept of HR Analytics and having their subsidiary in India from different industry clusters like: IT, Banking, Education, Consulting, Insurance, Automobile, Finance, Aviation, Power, will be the primary focused group for the present study.

Multinational Companies: As per Section 2(42) of Companies Act2013 "Multinational companies or foreign company" means any company or body corporate incorporated outside India which- a) has a place of business in India whether by itself or through an agent, physically or through electronic mode, and b) conducts any business activity in India in any other manner. [Source: Companies Act 2013]. Transnational Corporation Any corporation that is registered and operates in more than one country at a time, also called a multinational corporation.[Wikipedia,2021]

A transnational, or multinational, corporation has its headquarters in one country and operates wholly or partially owned subsidiaries in one or more other countries. The subsidiaries report to the central headquarters. [LegalDictionary,2021] [https://legal dictionary]

4.1.6 Sample Unit: There is multiple firms' worldwide serving variety of industries but there are few who claim to be a follower of HR Analytics. For this research, the multinational corporations which are using the concept of data analytics in HR will be studied. The firms those are using the concept of HR Analytics like IBM, Google, Xerox, Belong, Juniper Networks, Aasonn, Active8 Intelligence, EPAY systems, Gatti HR, Glint, Drawing Box, One View HR, One source Virtual, People Fluent, Visier, Tomorrow, P Maps Consultant, People Wiz Consulting, Panache Global Solution, One View HR,MindTree, CongAgra Foods Inc, Byju's, etc. would be worked as a sampling unit for the proposed research.

Table:2 Defining Sampling Units

Sector	No of Companies
IT	6
Banking	3
Education	2
Consulting	5
Insurance	4
Finance	3
Aviation	2
Power	2

The targeted sample unit might be varying during data collection as per the research objectives.

4.1.7 Calculation of Sample Size: It is critical to choose the most appropriate sample size for the research as very less sample size will give inappropriate results and very large sample size would lead to wastage of resources like time, effort, and money. Hence, following the Slovin's formula for finite population (known) will be used to arrive at a representative number of respondents (Slovin, 1960).

$n = N/(1+Ne^1)$

n-Sample size of the Population N-Population Size

e-Desired level of Precision/ Margin of Error at 5% (Based on Scenarios - See Appendix).

Based on calculation of sample size (refer Appendix), the preliminary sample size is computed to be 240. In this study hence the minimum expected total number of contacts is computed at 240 based on above formula computation.

4.1.8 Statistical Techniques:

To achieve the objectives of the study and to test the corresponding hypotheses, the following tools will be used.

Table:3 Statistical Techniques

Objectives of the Study	Statistical Techniques
1. To investigate and gain insight into the long run of HR analytics if integrated into the multinational corporations to help managers in predictive decision-making supported statistical evidence and relevant HR analytical data and literature.	Correlation and Regression
2. To analyze the impact of pandemic strategies adopted by MNC's for predictive decision making through HRAnalytics.	Correlation and Regression
3. To explore the effectiveness of 4C's framework as an efficient HR analytics framework.	Correlation and Regression

Also, descriptive statistics (Mean, standard deviation) and ANOVA will be used or any other appropriate statistical tool will be used once the data is collected.

Sampling Technique: Judgmental Sampling will be used in this study. Judgmental/Purposive sampling would allow researcher to select more accurate and representative sample from the corporations at various levels that can bring in more precise results and holistic knowledge on the subject across levels.

4.1.9 Data collection instruments: To fulfill the objectives and test hypotheses both primary and secondary data will be used.

4.1.10 Primary data collection: To support research objectives, primary data will be collected through personal interview, constructed questionnaire and observation method. Specific multinational companies those are using the concept of analytics in human resource management would be identified to carry out the interviews (HR heads, executives) and to fill up the questionnaires.

4.1.11 Secondary data collection: Secondary data will be collected through: Magazines like SHRM monthly magazine, People Matters Journals, Harvard Business Review, Mckinsey Quarterly journal, AI HR magazine, Newspapers like The Economic Times, Mint, The Hindu and others. Websites like SHRM, People Matters, Books and Journals based on HR analytics, Data analytics, Published and Unpublished source like dissertations.

Section- 5

Proposed Chaptalization:

The thesis will contain the following chapters:

Chapter 1-Introduction

Chapter 2-Review of Literature and Gap- Identification

Chapter 3-Conceptual framework of the study

Chapter 4- Research design and Methodology

Chapter 5-Data Analysis, Results, and Interpretation

Chapter 6- Conclusion and Suggestions

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APPENDIX

Calculation of Sample Size: It is critical to choose the most appropriate sample size for the research as very less sample size will give inappropriate results and very large sample size would lead to wastage of resources like time, effort, and money. Hence, following the Slovin's formula for finite population (known) will be used to arrive at a representative number of respondents (Slovin, 1960).

n-N/(1+Ne')

n- Sample size of the Population N-Population Size

e-Desired level of Precision/ Margin of Error at 5% (Based on Scenarios - See Appendix).

N-600

e=0.05 (5% margin of error) n-600/1+(600*(0.05)'')

-600/1+(600*0.0025)

-600/1+ (1.5)

-600/2.5

-240

Hence the minimum expected total number of contacts is computed at 240 based on above formula.